

symptomatically or even left alone and the main principle adhered to they will often subside, become less severe and frequent as time goes on and finally disappear.

Attention has been previously directed to the fact that when convalescence is thoroughly established an increased caloric intake is often possible sometimes to such a degree that the individual can resume his previous activities with even added efficiency.

It is impossible, without going to too great length, to particularize regarding factors and signs which should be observed in carrying a case of arthritis over the long road to recovery. Experience alone will yield them. The point has been reached, however, at which a further addition of exact data has placed the treatment of arthritis by low caloric feeding upon a basis more secure than existed previously, so that the principle of application can be appreciated even in the presence of departures from rule. It is hoped to publish further data in this connection in the not distant future.

## THE PATHOLOGY OF BRONCHIAL ASTHMA.

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TWELVE years ago one of us (A. G. E.) discussed in this JOURNAL<sup>1</sup> the pathology of bronchial asthma as based on a study of 7 previously reported cases and 1 personally added. The conclusion reached at that time was that there is no constant or definite change in the bronchi of persons dying during an attack of this condition. Since that time 3 additional cases have been reported. The history of one of these was published in the *Transactions of the German Pathological Society* for 1909. The other 2 are the more recent ones of Brown<sup>2</sup> and Boughton.<sup>3</sup> The first 2 are not accessible to us.

The case of Boughton was reported as one of death from anaphylaxis and followed the injection of one minim of horse serum as a desensitizing agent. The effect of the injection of that minute quantity of serum was a typical attack of bronchial asthma, with fatal termination, in forty-five minutes. The subject was an otherwise healthy man who for ten to twelve years had suffered attacks of asthma when in proximity to horses. Post mortem the lungs

<sup>1</sup> 1908, cxxxvi, 407.

<sup>2</sup> Asthma, St. Louis, 1917.

<sup>3</sup> Jour. Am. Med. Assn., 1919, lxxiii, 1912.

showed emphysema. Microscopically there was a little mucus and a few desquamated epithelial cells in some of the bronchioles—not more than a slight catarrhal bronchitis if it can be called that. Boughton does not mention the sputum of this patient.

To these cases we can now add a twelfth, recently studied in Siriraj Hospital. Clinically it is of interest because of the family history of asthma in four generations. Furthermore, the duration of the disease, with attacks from childhood to the age of fifty-two years, would supposedly lead to permanent histologic changes in the bronchi if such ever occur in this affection.

**History of Case.** The patient was a Siamese man, aged fifty-two years, at one time an actor but chiefly engaged as a fishmonger at a seaside town. He did not smoke opium nor Indian hemp. His grandmother (father's side), father, an uncle and an aunt had asthma and the patient's third child is also suffering from the affection.

Patient since childhood had suffered from attacks of asthma, which at first were at long intervals but gradually became more frequent. Three months before admission to the hospital his feet and legs began to swell, this finally including the whole body. Coughing and shortness of breath were for a long time prominent symptoms, both gradually becoming more marked. On admission the man was edematous, ascitic, cyanosed and had respiratory dyspnea, with abdominal breathing and respirations, thirty-four to the minute. He had a troublesome cough, productive of white, tough sputum (this was not examined in the laboratory). Rales were present, especially over the bases. The precordial area was resonant and heart sounds weak. Treatment gave no relief; the patient gradually became worse and died on the eleventh day after admission, clinically from heart failure.

**Postmortem Findings.** The body was edematous. All the serous cavities, except the left pleura, which was obliterated by adhesions, contained a marked quantity of serum. The right auricle and ventricle were dilated and contained fluid blood under pressure. The wall of the right ventricle was 1 cm. thick. The left ventricle was moderately dilated; the muscle was red and firm. Valves and vessels were normal.

The left lung was collapsed to about one-half the usual size. The incised surfaces were dark bluish-red in color. Crepitation was much lessened but there was no actual consolidation. The bronchial mucosae were intensely red. In the middle-sized and smaller bronchi was tenacious mucus, but not in great quantity.

The lower lobe of the right lung was like the left and the bronchi were similar. The upper and middle lobes were overdistended and at the apex were subpleural blebs. These lobes pitted on pressure, were pale and on incision dripped frothy serum. Crepitation was

lessened but there was no consolidation. The bronchial mucosa in these lobes was pale and the lumina contained no exudate.

The abdominal organs contained an excess of blood. Summary: Hypertrophy and dilatation of right ventricle; dilatation of right auricle and left ventricle; bilateral chronic adhesive pleuritis; partial atelectasis of left lung and lower lobe of right; vesicular and interstitial emphysema of upper and middle lobes of right lung; acute bronchitis of left lung and lower lobe of right; congestion of spleen, kidneys, stomach and liver; anasarca; multiple serous effusions.

Spreads of the exudate in the bronchi are of leukocytes and many columnar epithelial cells. In the cellular mass is much mucus and a number of very typical Curschmann's spirals. Chareot-Leyden crystals are not present and staining reveals only an occasional eosinophile.

Microscopically the partly collapsed portions of the lungs contain considerable black pigment, with at points fibrous tissue increase around it. Most of the epithelial lining of the bronchioles is desquamated and its place is occupied by leukocytes, nearly all mononuclear, which also partly fill the lumina. The vessels in the walls are intensely hyperemic and the tissues are densely infiltrated by mononuclear cells. In the middle-sized bronchi epithelial desquamation varies in degree, but in general is less than in the smaller ones. In the lumina are many mononuclear leukocytes and some red blood cells. In some of these larger tubes is a small quantity of mucus but no spirals. In none of the bronchi are crystals or eosinophiles. There is no evidence of fibrous tissue thickening of the bronchial walls nor does the muscularis mucosa appear abnormal. The larger bloodvessels are somewhat sclerotic. The bronchi in the expanded portions of the right lung have much less marked changes, indicating that the compression atelectasis of the other parts had increased the catarrhal changes.

The histology of the bronchi may therefore be summarized as that of an acute catarrhal bronchitis. We have in this case then to deal with a man who had had increasingly frequent attacks of asthma since childhood, but with no greater changes in the walls of his bronchi than might develop in a few days during an acute inflammation without asthma. As to the bronchial content, spirals are, of course, not commonly found in catarrhal exudates, but they have been encountered, according to Kaufmann, in cases of lobar and bronchopneumonia, fibrinous bronchitis, pulmonary edema and behind bronchial stenosis due either to enlarged pigmented glands or peribronchial malignant tumors. They are therefore not specific either in origin or in significance when found in the sputum, although, of course, much more common in cases of bronchial asthma. Nothing in the structure of the bronchi explain their formation in any case.

In conclusion, these additional cases still further emphasize the conclusions of the former paper, namely, that the histology of the bronchi does not explain the course of bronchial asthma. The length of time a person suffers from the disease and the number of attacks he has are apparently without effect upon the bronchi. The theory of spasm of the bronchial muscles, while not thus proved, is by each case increasingly favored.

### INFLUENZA.\*

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In considering the subject of "influenza," it is important to have clearly in mind to just what disease one is referring. The disease which will be discussed in this communication is the one which appeared as a pandemic in the autumn of 1918 throughout the United States and has appeared subsequently, with pretty general distribution, during the winters of 1918-19 and 1919-20. Just what relation this disease, which appeared in pandemic form, bears to the conditions ordinarily spoken of as influenza, grippe, fever of unknown cause, acute respiratory infection, etc., is not clear. It is possible that the pandemic disease was simply one of these in which the virus had become temporarily intensified, but it seems more likely that it was an independent disease.

In order to have a clear conception of this condition called influenza, it is exceedingly important to separate the disease itself from the subsequent complications. This is rendered additionally difficult because the etiology of the pandemic disease is not settled. If the influenza bacillus eventually turns out to be the cause of this pandemic disease, many of the lesions which are now looked upon as complications will have to be considered as part of the disease.

The etiology of this pandemic disease has been the subject of considerable discussion. This has narrowed itself down practically to the question of whether the influenza bacillus described by Pfeiffer following the epidemic in 1889-90 or some other unknown organism was the causative agent. At one time it was suggested that this pandemic disease might be some form of the plague, but it is now felt by most authorities that such was not the case. Folley<sup>1</sup> aroused considerable interest in regard to the etiology of this disease by reporting the presence of a coccobacillus similar to the plague organism in the blood serum in many of these cases, but his findings have not been confirmed by other observers.

\* Presented at the meeting of the Alumni Association of the Medical Department of the University of Buffalo, June 10, 1920.